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Review Article

BENIGN PROSTATIC HYPERPLASIA: UPDATED REVIEW

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ABSTRACT

Benign Prostatic Hyperplasia (BPH) is one of the commonest medical conditions affecting the geriatric male population. The enlargement of prostate can lead to various clinical symptoms like difficulty in voiding, urinary retention etc. The symptoms are varied depending on the size of enlargement. The International Prostatic Symptom Score (IPSS) is the gold standard and first step in understanding and diagnosing the disease clinically, but in the recent past there are various other newer tools to diagnose the prostate hyperplasia. Event is the treatment modalities, the management of BPH has grown incredibly. Both medical and surgical management would aid the patients in increasing the Quality of life and reduces the disease burden.

Keywords: Benign Prostatic Hyperplasia, Geriatric, International Prostatic Symptom Score.

INTRODUCTION

Benign prostatic hyperplasia (BPH) is one of the most common conditions affecting the elderly males[1], as the elderly constitute the major proportion of the population. This result in a major impact on the medical practice nowadays.[2] The enlargement of the prostate can produce voiding symptoms, which can lead to pathological changes in the urinary bladder and the kidney. Management of BPH has also changed significantly with a considerable advance in the understanding of the demographics and natural history of the disease.[3] The pharmacotherapy of BPH comprises of alpha-1 receptor antagonists, 5-alpha reductase inhibitors, phytotherapy, Gonadotropin releasing hormone analogues and androgen receptor blockers.

Prevalence of BPH

Previously, the prevalence of BPH used to be determined only from autopsy studies only. Approximately half of the men in the sixth decade of life exhibited histological evidence of BPH. Almost 90 % of men developed histology BPH by the ninth decade of life. A review of the literature provides compelling evidence that the prevalence of histology BPH is similar throughout the world.[5] The specific factors that initiate and promote the proliferative process are unknown. The development of histology BPH requires both ageing and androgens.[6,7] Dihydrotestosterone (DHT) is the specific androgen mediating prostate for its development and growth. Testosterone is converted to DHT by the enzyme 5-alpha reductase (5AR). There are two subtypes of 5AR, type 1 and type 2. The primary subtype in the prostate is Type 2. Males with the 5AR deficiency syndrome do not convert intraprostatic testosterone to DHT.[8] Interestingly, males with this syndrome have rudimentary prostates as adults and do not develop BPH.[9] Long-term treatment with the 5-alpha reductase inhibitors (5ARIs) dutasteride[8] and finasteride[10] not only causes some reduction of prostate volume but also prevents further growth of the prostate. The primary advantage of dutasteride is that it inhibits both 5-alphareductase type 1 and type 2 subtypes, which results in a more complete suppression of DHT production. All of these observations demonstrate a pivotal role for androgens in the development of the prostate and BPH. The observation that the growth of the prostate does not directly correlate with DHT levels[11] suggests that although DHT permits growth, factors other than the androgen are also responsible for the ultimate degree of prostatic enlargement.

Epidemiology of BPH

It is postulated that age and normal androgenic functions are the two most well established factors causing this condition.[12] BPH is a pathological diagnosis rather than a definite clinical entity. The earliest microscopic deposits of such nodules can be found in the fourth decade. In a community based survey of 1500 men aged 50 years or older in UK, the prevalence of LUTS (Lower Urinary Tract Symptoms) was 41 % overall.[13]

History of BPH

The concept of obstruction by the enlarged prostate causing LUTS can be traced back to John hunter, one of the most influential British surgeons of the eighteenth century. In 1786, Hunter wrote"…… swelling of the prostate is the most common in the decline of life….when diseased to alter its shape and size, it must obstruct the passage of urine".[14] He continued to describe both the symptoms attributable directly to obstruction and those "….that urethral obstruction resulted in thickening of the wall of the bladder and irritability"

Anatomy of Prostate

Embryology

The prostate gland develops from the pelvic portion of the urogenital sinus, which is 10-12 weeks of the gestation.[15,16] The prostate arises after the development of numerous endodermal buds, which initially proliferate throughout the entire length of the primitive urethra. The endodermal buds next invade the surrounding urogenital sinus mesenchyme[15], which is responsible for the development of the connective tissue and muscular constituents of the definitive prostate. The gland is well differentiated by the end of fourth month. Conversion to dihydrotestoterone is essential for the growth and development of the prostate.[15]

Gross Anatomy

The prostate gland is located between the bladder and the rectum and wraps around the urethra .[17] It is transversed by prostatic part of urethra and ejaculatory ducts.[17] It's base is towards the bladder neck and apex merges with the

membranous urethra to rest on the urogenital diaphragm.[18,19] It is the largest accessory gland of the male reproductive system.[19,20] It is basically composed of different cell types: 1. Glandular cells, which produce a milky fluid that liquefies semen. 2. Smooth muscle and Stromal cells, which contract during sex and squeeze the fluid from the glandular cells into the urethra, where it mixes with sperm and other fluids to make semen. The muscle cells are stimulated by molecules called alpha adrenergic receptors. It weighs approximately around 40 g measuring 4 cm transversely, 3 cm in length and 2 cm in its anteroposeterior diameter.[16,18] The prostate gland is divided into five lobes, which can be distinguished in the foetal life prior to 20 weeks of gestation.[18] The median lobe is of great clinical importance where it gets 5 affected by the hypertrophy. The prostate is surrounded by a fibrous capsule, outside the capsule there is a fibrous sheath which is part of the pelvic fascia.[17] The urethra runs vertically downward from the base to slightly in front of the apex, at two third of the gland.[18] Ejaculatory duct passes postero-lateral to the median lobe and opens at the colliculus on the each side of the prostate utricle.[20] Prostate utricle is a mucous culde-sac about 6mm long and extends upwards and backwards from the colliculus behind the median lobe.

Arterial supply

Prostate is supplied by prostatic branch of the inferior vesical artery, middle rectal artery and the internal pudendal arteries.[16,20]

Venous supply

Venous drainage is by prostatic plexus of veins.[16]

Nerve supply

Inferior hypogastric plexus conveys the sympathetic nerves; the preganglionic fibers are derived from the L1 and L2. The parasympathetic fibres derived from the pelvic splanchic nerves, the pregangionicfibers are from S2, S3 and S4.[21]

Physiology

It is a male accessory sex gland that contributes considerable part of semen. Its secretion is milky and thin and contains acid phosphates ion, calcium citrate ion, fibrinolysin, prostaglandin and zinc.[21,22] The growth and the function of the prostate is under the control of endocrine hormones i.e. androgens are essential for the prostate to achieve and maintain normal tissue mass, composition and secretary 6 function. The slightly alkaline prostatic fluid helps to neutralize the acidity of the other seminal fluids during the ejaculation and thus enhances the motility and fertilization of the sperm with the ovum.[22]

Changes during the Lifespan

At birth, the prostate is about the size of a pea. It grows only slightly until puberty, when it begins to enlarge rapidly, attaining normal adult size and shape, about that of a walnut, when a man reaches his early 30s. The gland generally remains stable until about the mid-forties[23], in most, the prostate begins to enlarge again through a process of cell multiplication.

Histopathology

The changes are of two types- overgrowth of the glandular elements and overgrowth of the connective tissue elements.[24] Depending on which of the elements predominates, the consistency of the enlarged gland will vary. In case of overgrowth of the glandular elements the consistency is softer in comparison to the overgrowth of the connective tissue elements, in which the consistency will be firmer. The enlargement can involve any part of the gland except the posterior and the anterior lobe. The two lateral lobes and the median lobe are most frequently involved. The enlargement of the gland is due to the formation of the nodules. The nodules may fuse together to form a mass.[25] The hyperplasia affects the inner submucous group of the gland which enlarges the rest of the gland. Later it compresses the gland to such an extent it forms the false capsule consisting of outer part of the gland which consists of fibrous tissue with a little muscular tissue and very little glands. A line of cleavage is set between the nodular mass and the surgical capsule. Microscopic examination reveals that there is a hyperplastic change in glandular, fibrous and muscular portions of the gland.[24] There is hyperplasia of the stroma around the ducts, acini and urethra which occurs early. Then there is a great proliferation and budding of ducts and acini leading to the hyperplasia of both stroma and the glands ultimately to the formation of the nodules.

Causes of Benign Prostatic Hyperplasia

A number of theories have been proposed to explain benign cell growth.

Hormonal Changes

Male Hormone: Androgens (male hormones) are most likely play a role in prostate growth. The most important androgen is testosterone, which is produced throughout a man's lifetime. The prostate converts testosterone to a more powerful androgen, dihydrotestosterone.[26] DHT stimulates cell growth in the tissue that lines the prostate gland (the glandular epithelium) and is the major cause of the rapid prostate enlargement that occurs between puberty and young adulthood. DHT is a prime suspect in prostate enlargement in later adulthood.[27] Estrogens: Some authorities believe that the female hormone estrogen may also play a role in BPH[28]; some estrogen is always present in men. As men age, testosterone levels drop and the proportion of estrogen increases, possibly triggering prostate growth.

Family History

A family history of BPH appears to increase a chance of developing the disease.[27] Other factors such as smoking, socioeconomic status, diet, race and sexual activity.[27]

Clinical Evaluation

Initial symptoms of benign prostatic hyperplasia include difficulty in starting to urinate and a feeling of incomplete urination. As the prostate gland grows larger, it presses upon the urethra and narrows it. This blocks the flow of urine. The bladder begins pushing harder to get the urine through, which causes the bladder muscles to become larger and more sensitive. This makes the bladder never fully empty, and causes a feeling of needing to urinate frequently. Other symptoms include a weak stream of urine, dribbling of urine right after urinating; the need to urinate at night more frequently.[29] If the bladder ends up overfilled, patient may experience leaking of urine, or incontinence. Some men will have repeated urinary tract infections and kidney stones. Urinary tract infections cause burning or pain during urination, and possibly fever. Blood can appear in the urine if he strains to urinate, which can cause small veins in the urethra and bladder to burst. These symptoms are divided

empirically as irritative and obstructive.[29,30] Irritative symptoms are increased frequency, nocturnal urgency and urge incontinence. The obstructive symptoms are hesitancy, decreased flow of urine, straining, feeling of incomplete emptying of bladder, prolonged urination and urinary retention.[29]

Diagnostic Test

International Prostatic Symptom Score

This questionnaire - called the International Prostate Symptom Score – was developed by a committee of the American Urological Association.[31] An indexing tool called the International Prostate Symptoms Score (IPSS) can help evaluate the key lower urinary tract symptoms. As opposed to laboratory tests or other objective tests, this scoring system measures the patient's own experience. The higher the score, the more severe is the condition. It is useful for many reasons: The patients score on this test gives a highly accurate assessment of the effect of lower urinary tract symptoms on the quality of a man's life.[32]

Other Indexing Systems

Other indexing systems, such as Madsen-Iverson point system, the Boyarsky guidelines, Maine Medical Assessment Score, Symptom Problem Index (SPI) and the BPH Impact Index (BII), which gauge different quality-of-life and disease issues, are being used in addition to the IPSS to help assess the patient.[32]

Physical Examination

Digital Rectal Examination

The digital rectal examination (DRE) is used to detect an enlarged prostate. The doctor inserts a gloved and lubricated finger into the patient's rectum and feels the prostate to estimate its size and to detect nodules or tenderness. The examination is quick and painless, but embarrassing for some. The test helps to rule out prostate cancer, but it is generally underestimates the prostate size. It is not accurate for diagnosing prostatic hyperplasia, and is never the primary diagnostic tool for either BPH or cancer.

Others

Certain procedures that test reflexes, sensations, and motor response may be performed in the lower extremities to rule out possible neurological causes of bladder dysfunction, palpate the abdomen to detect signs of kidney or bladder abnormalities.

Uro-flowmetry

To determine whether the bladder is obstructed, the speed of urine flow is measured electronically using a test called uroflowmetry.[32] The patient is instructed not to urinate for several hours before the test and to drink plenty of fluids so he has a full bladder and a strong urge to urinate. To perform this test, a patient urinates into a special toilet equipped with an uroflowmeter. It is important that the patient remains still while urinating to help ensure accuracy, and that he urinates normally and does not exert strain to empty his bladder or attempt to retard his urine flow. Many factors can affect urine flow (such as straining or holding back because of self-consciousness) so experts recommend then that the test be Repeated at least twice. The values more than 15 ml per second and voiding volume of 150 ml or more is considered to be the normal range.[32] Qmax: The rate of urine flow is calculated as milliliters of urine passed per second (ml / s). At its peak, the flow rate measurement is recorded and referred to as the Qmax. The higher the Qmax, the better the patients flow rate.

Urine Analysis

A urine analysis may be performed to detect signs of bleeding or infection. A urinalysis involves a physical and chemical examination of urine. Urine is examined under a microscope. Although urinary infection is uncommon in younger men, it occurs more frequently in older men, particularly those with BPH. A urinalysis also helps rule out bladder cancer.

Serum Creatinine

In men with symptoms, blood tests are performed to measure serum creatinine, which is a marker for kidney function test.[27] Renal problems exist in most of the BPH patients.

Prostate Specific Antigen (PSA)

A PSA test measures the level of prostate-specific antigen (PSA) in the patient's blood. It is the standard screening test for prostate cancer.[27] A PSA is recommended annually for all men over 50 years old and for men over 40 who are at high risk for prostate cancer. BPH itself can also raise PSA levels, but the test has generally been optional for men with suspected BPH. The decrease in the prostate size corresponds to the decrease in the PSA levels. Every 19 % decrease in the PSA levels there is a decrease of prostate volume by 10 %.[35] Certain treatments for BPH, including the drug finasteride and the surgical procedure transurethral resection of the prostate (TURP), can reduce PSA levels and possibly mask the existence of prostate cancer. The normal values should be less than four nanogram / millilitre. A more recent test identifies so-called free PSA, which is found in lower levels when prostate cancer is present and in higher levels with benign prostate hyperplasia. This may be more accurate than total PSA, regardless of whether a man is taking finasteride or not.

Postvoid Residual Urine

One of the important tests for urinary incontinence is the postvoid residual urine volume (PVR), the amount of urine left after urination. Normally, about 50 mL or less of urine is left; more than 200 mL is a definite sign of abnormalities. The most common method for measuring PVR is by transabdominal ultrasonography. PVR can also be measured using a catheter, a soft tube that is inserted into the urethra within a few minutes of urination.[33]

Ultrasound

Ultrasound of the prostate does not require a catheter and gives an accurate picture of the size and shape of the prostate gland. Ultrasound is very beneficial when planning surgery and determining treatment options and gauging their effectiveness. Ultrasound may also be used for detecting kidney damage, tumors and bladder stones. It can give an accurate measure of postvoid residual urine and is less invasive.[34] Other Ultrasound test for the prostate is, Transrectal ultrasonography (TRUS) uses a rectal probe for assessing the prostate. TRUS is significantly more accurate for determining prostate volume. It can sometimes detect cancer.

Filling Cystometry

Filling cystometry, also called cystometrography, is usually used for patients who cannot urinate and in whom nerve damage or injury of the bladder is suspected.[34] The test is used to determine the absence or presence of a condition called uninhibited detrusor contractions (UDC), which often occurs in men with storage urinary tract symptoms. The detrusor is the group of muscle fibres that cover the outside of the bladder. The test is not used routinely.

Urethrocystoscopy

An urethrocystoscopy, also called cystourethroscopy, may be performed in men diagnosed with BPH, particularly if they are surgical candidates or if other urinary tract problems are suspected. Such problems include blood in the urine, infection, interstitial cystitis, bladder cancer, or prior surgery or injury. The urologist can determine the presence of a number of structural problems, including enlargement of the prostate, obstruction of the urethra or neck of the bladder, anatomical abnormalities, or the presence of stones. In this procedure, a flexible or rigid fiber optic tube (an endoscope) is inserted into the urethra to allow doctors to view the lower urinary tract. The procedure is not without risks. Complications are uncommon but can include allergic response to the anaesthetic, urinary tract infection, bleeding, and urine retention.[34]

Bladder Obstruction

Men are more likely to tolerate voiding symptoms (intermittent flow, hesitancy before urinating) and seek help for storage symptoms (urgency, frequency, urination at night).[35] Voiding symptoms, however, may indicate an obstruction blocking the bladder, which if extensive can severely reduce urine flow and cause other complications, some serious. Acute Urinary Retention: Sometimes a man is unaware of an obstruction: until he suddenly cannot urinate at all.[35] This condition is called acute urinary retention. It is a dangerous complication that can damage the kidneys and may require emergency surgery. In general, BPH progresses very slowly and acute urinary retention is very uncommon. Men with BPH at highest risk for this complication tend to be elderly and to have moderate to severe lower voiding symptoms.

Treatment

Because BPH rarely causes serious complications, men usually have a choice between treating it than opting for watchful waiting Treatment Options: The primary goals of treatment for BPH are to improve urinary flow and to reduce symptoms. Many options are available. They include drug therapies, minimally invasive procedures, and major surgery.

Watchful Waiting

Watchful waiting is appropriate in patients with a low IPSS symptom score (zero to seven) because studies have shown that medications are not significantly more effective than placebo in these patients.[34] However, follow-up monitoring isimportant, serious complications such as sepsis, upper tract dilatation with or withoutrenal in sufficiency and acute urinary retention (even without treatment) can occur.[36] Patients with higher IPSS symptom scores should be given information on appropriate treatment options.

Complementary Medicine

Interest in alternative treatments for BPH increased after epidemiologic studies showed a lower incidence of BPH and prostate cancer in Asians compared with persons from Western countries.[37] One postulated explanation is the higher soy content of the typical Asian diet. Genistein, a major isoflavone ingredient of tofu, has been found to decrease the growth of hyperplastic prostate tissue in histoculture.[38] Because natural soy food products are not readily available or accepted worldwide, a standardized isoflavone product containing genistein may be tried.[39] Initial short term studies showed rapid relief of BPH symptoms. However, long-term and independent studies are not available. Saw palmetto (Seren a repens) is a popular complementary treatment for BPH.[40]Although it has been shown to inhibit the enzyme 5-alpha reductase, this has not been confirmed clinically.[41] In patients with BPH and saw palmetto has been shown to be as effective as finasteride but not as effective as other medical treatments like alpha blockers. In an analysis of 18 studies, [40]saw palmetto had fewer side effects than traditional medications, and serial ultrasound examinations showed that treatment with this medicinal herb decreased prostate size without changing serum PSA levels. The usual dosage of saw palmetto is 160 mg twice daily. Side effects are rare (incidence of less than 3 percent) and usually consist of mild headaches or gastrointestinal upset.[41] Throughout the world, other herbal or complementary medicines are used to treat BPH.[41] However, many of these medicines are not standardized or have not been well studied for efficacy. Commonly used agents include African plum, South African star grass, stinging nettle, and rye pollen.[41]

Medical Treatments

Nonselective Alpha-1 Blockers

Doxazosin, prazosin, and terazosin reduce prostatic smooth muscle tone and, thus, have an immediate effect on urinary flow. Although these medications quickly improve BPH symptoms, International prostate symptom scores improve less than with surgery.[34] Side effects occur such as dizziness, postural hypotension, fatigue, asthenia and retrograde ejaculation.[42] Side effects can be minimized by bedtime administration and slow titration of the dosage. Alpha blockers can be used with other therapies as needed. Prazosin has the cost advantage of generic availability.[43]

Selective Alpha-1 Blocker

Tamsulosin is a highly selective alpha-1 adrenergic antagonist that was developed to avoid the side effects of non selective agents. Some patients who do not respond to non selective alpha blockers may respond to tamsulosin and, because of the selectivity, may have fewer side effects, including hypotension. Tamsulosin is initiated in a dosage of 0.4 mg once daily[2], with a maximum dosage of 0.8 mg per day. Tamsulosin has no antihypertensive effect and is more expensive than non selective alpha blockers.

5-Alpha Reductase Inhibitors

Finasteride slowly induces a 50 percent reduction in the serum dihydrotestosterone level.[23] As a result, prostatic volume decreases by about 19 percent over three to six months of treatment.[23] The treatment with finasteride led to significant improvements in urinary symptoms and flow rates. However, in the Prospect study, the improvements with finasteride were significantly less than those with any alpha blocker or surgery.[34] Studies suggest that finasteride may

work best in men with a large gland, whereas alpha blockers are effective across the range of prostate sizes. The incidence of side effects with finasteride is similar to that with placebo (4 to 5 percent). Adverse effects include decreased libido, ejaculatory disorder, and impotence. Finasteride decreases PSA levels by 40 to 50 percent. In a patient taking finasteride who has PSA screening, PSA levels should be doubled and then comparedin the usual fashion to age-related norms. There is no change in sensitivity orspecificity for the diagnosis of prostate cancer. The U.S. Food and Drug Administration recently labelled dutasteride in 0.5-mgcapsule form, for the treatment of BPH[43] (labeling for male-pattern baldness ispending). This drug has a distinct mechanism of action; in that it blocks both types 1and 2, 5alpha reductase.[44] Sexual side effects are similar to those of finasteride.

Hormonal Treatment

Gonadotropin-Releasing Hormone Agonists

The release of GnRH from the hypothalamus occurs in a pulsatile fashion, stimulating the anterior lobe of the pituitary gland to release luteinizing hormone. When exogenous GnRH is administered, endogenous production of GnRH decreases, and the pulsatile signal to the anterior pituitary lobe is ablated, inhibiting the release of luteinizing hormone; without luteinizing hormone, the testicular Leydig's cells fail to secrete testosterone. The most successful results of GnRH treatment for BPH were reported by Gabrilove and associates. In that study, patients treated with daily subcutaneous injections of leuprolide (a GnRH agonist) for 6 months had improvement in urinary flow and, to a lesser extent, in nocturia and frequency.[45,46] The size of the prostate decreased by an average of 45 %.[45]

Androgen Receptor Blockers

Flutamide is a non steroidal anti androgen that competes with dihydro testosterone for androgen receptor sites.[47] The absence of androgenic stimulation leads to decreased cellular protein synthesis, cell shrinkage, and apoptosis(cell death). In a prospective, placebo-controlled trial, patients receiving flutamide at750 mg / day had a 41 % mean decrease in prostatic size and a 35 % mean increase inurinary flow. Symptomatic improvement was equal in the flutamide and placebo groups. Gynaecomastia was experienced by the patients receiving flutamide; others like Diarrhoea and increase in the liver transaminase were reported.[48] with flutamide treatment, the serum levels of luteinizing hormone and testosterone actually increase[48]; thus, some of the side effects related to testosterone inhibition (impotence) are avoided. Because estrogens are synthesized from androgens, these men have elevated estradiol levels. Hence, breast pain plus gynecomastia may occur and maybe dose limiting. Overall, anti androgen and GnRH agonist therapies for BPH will lead to significant improvement in about one-third of cases. The annual costs of anti androgen and GnRH agonist therapies are expensive. The undesirable side effects and the prohibitive costs of these agents have limited their widespread use as medical treatments for symptomatic BPH.[32]

Surgical Treatments

Surgery should be considered in patients who fail medical treatment, have refractory urinary retention, fail catheter removal, or have recurrent urinary tract infections, persistent hematuria, bladder stones, or renal insufficiency.[34] Surgery can also be the initial treatment in patients with high IPSS symptom scores who want surgical treatment and are good candidates for surgery.

Open Prostatectomy

Surgical removal of theinner portion of the prostate using a suprapubic or retropubic approach is the oldest and most effective treatment for relieving the symptoms of BPH and increasing maximum urinary flow. Symptomatic improvement occurs in 98 percent of patients who undergo this procedure, and there treatment rate is only 2 percent. However, open prostatectomy is the most invasive treatment for BPH and is associated with the most morbidity. Therefore, this procedure is typically reserved for use in patients with a very large prostate gland or structural problems such as a large median lobe that protrudes into the bladder or a large bladder calculus or urethral diverticulum.

Transurethral Resection of the Prostate (TURP)

The most commonly employed surgical procedure for BPH, TURP reduces symptoms in 88 percent of patients. The most frequent complications of the procedure are inability to void, clot retention, and secondary infection. Bleeding, the most morbid complication occurs in only 1 percent of patients. Long-term complications include retrograde ejaculation, impotence, partial incontinence, and total incontinence.[34,49] Approximately 10 percent of patients require retreatment within five years.[34]

Newer Procedures

Many elderly patients with BPH are poor surgical candidates, and manyyounger patients find the risk of sexual dysfunction associated with TURP to beunacceptable. "Minimally invasive" surgical techniques have been developed in an effort to obtain the same results as TURP, but at a lower cost and with less morbidity. The availability and use of these newer procedures vary regionally. Transurethral incision of the prostate (TUIP) is an endoscope procedure using only one or two incisions to reduce constriction of the urethra without removing any of the prostate gland. TUIP can be performed as an outpatient procedure. It is generally offered as a treatment option for younger patients in whom fertility and antegrade ejaculation are important issues. Outcomes are similar to those with TURP, but the procedure takesless time to perform and causes less bleeding. Long-term satisfaction and retreatment rates have not been adequately studied. Transurethral microwave thermotherapy (TUMT) is a single-session, minimally invasive outpatient treatment in which a microwave antenna is placed in aurethral catheter. Microwave energy causes deep, rapid tissue heating, while acooling system circulates water to protect adjacent tissue. General or spinal anaesthesia is not needed, and the procedure takes about one hour. Limited studies have shown a 65 percent decrease in subjective urinary symptoms and a 45 percent improvement in objective flow rates. Two years after undergoing TUMT, 7.3 percent of patients required retreatment.[50] No major complications, including incontinence and sexual dysfunction, have been reported in patients treated with TUMT. Another minimally invasive procedure is ablation of the prostate by electrode or laser. Some early studies showed that this procedure was associated with an increase in methicillin-21 resistant *Staphylococcus aureus* infections, possibly because all necrotic tissue was not removed.[51] Advances in electrodes, lasers and training have decreased the incidence of this complication. Transurethral vaporization of the prostate (TUVP)[52] or transurethral electro

vaporization of the prostate (TVP) is now performed using endoscopic electro surgical equipment to remove prostatic tissue with limited coagulation. The procedure provides urinary symptom reduction similar to that of TURP, with less postoperative irritation, urinary retention, blood loss, or risk of hyponatremia. As with TUMT, no tissue is obtained; thus, it is not possible to assess patient's for concurrent prostatic malignancy.[52] Transurethral needle ablation of the prostate (TUNA) involves the placement of radio frequency needles in the prostate. The procedure is safe and can be performed using local anaesthesia. However, results may be limited, because the bladder neck and median prostate lobe cannot be treated. Studies showed that IPSS symptom scores also decreased drastically and maximum urinary flow rates increased in patients who underwent TUNA.[53] In the past, transurethral balloon dilation of the prostate was used as a safe, minimally invasive treatment for BPH. However, the retreatment rate was high. Urethral stents can be placed to maximize the success of the dilation, but the stents are susceptible to infection or encrustation and re blockage. Because of the high complication rate, stent placement is usually reserved for use in patients who are high-risk surgical candidates with a short life expectancy.

CONCLUSION

Even though benign prostatic hyperplasia is one of the most common disorders amongst the geriatric population, the surgical treatment has grown tremendously compared to the medical treatment. The medical treatment provides only the symptomatic relief rather than curing the disease itself. Since most of the geriatric would be having an allied comorbidities like diabetes, hypertension which would not allow everyone to undergo the surgical procedures and hence medical treatment becomes accessible and hence lot of research needs to be focussed in this arena.

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